

We claim:

1. An active implantable medical device, in particular a cardiac pacemaker, defibrillator, cardiovertor and/or "multisite" device, for use with a detection and stimulation probe allowing the delivery to the heart of the pulses of low energy for the treatment of the disorders of the cardiac rhythm, comprising,

a metallic case containing a generator and a connector head, said generator being selectively configured to produce stimulation pulses in a monopolar mode and in a bipolar mode, said connector head comprising at least a first terminal and a second terminal able to be connected to a stimulation probe;

said generator further comprising a reference potential, a first switch controllable to connect and disconnect said first terminal to said reference potential, and a second switch controllable to connect said second terminal to said reference potential, and means for detecting the presence of a probe connected to the connector head, said probe being able to be a monopolar probe or a bipolar probe;

wherein said probe detecting means further comprises:

means for selectively producing monopolar stimulation pulses to one of said first and second terminals and bipolar stimulation pulses to said first and second terminals and controlling said first and second switches, wherein said stimulation pulses are deliverable, selectively with or without a reference potential connection;

means for detecting at least one pulse signal corresponding to a variation of potential induced on one of said first and second terminals and the metallic case in response to an applied stimulation pulse;

discriminating means for analyzing a shape characteristic of said at least one detected pulse signal and for delivering an indicator as a function of said analyzed shape characteristic representative of the presence or absence of a probe connected to said connector head; and

control means for selectively modifying at least one operating parameter according to the delivered indicator.

2. The device of claim 1, wherein said shape parameter comprises a width of said at least one pulse signal.

3. The device of claim 2, wherein said first terminal further comprises a ring terminal for coupling to a proximal ring electrode of a bipolar probe and the means for selectively producing stimulation pulses further comprises means for applying a stimulation pulse and controlling said first and second switches to obtain a disconnection of the reference potential connection, wherein said discriminating means further comprises means for comparing to a first threshold the pulse signal width detected on the ring terminal and the metallic case.

4. The device of claim 3, wherein discriminating means further comprises means for determining that the width of the detected pulse signal on said metallic case is less than said first threshold, and means, in response thereto, for delivering an indicator representative of one of an absence of a probe and a non implantation of the metallic case after connection of a probe.

5. The device of claim 3, wherein discriminating means further comprises means for determining that the width of the pulse signal detected on the first terminal is less than said first

threshold and the width of the pulse signal detected on the metallic case is greater than or equal to said first threshold, and means, in response thereto, for delivering an indicator representative of a presence of an implanted monopolar probe.

6. The device of claim 3, wherein the discriminating means further comprises means for determining that the width of the pulse signal detected on the metallic case and the first terminal is greater than or equal to said first threshold, and means, in response thereto, for delivering an indicator representative of the presence of an implanted bipolar probe.

7. The device of claim 2, wherein the means for selectively producing stimulation pulses further comprises means for applying a bipolar stimulation pulse and controlling said first and second switches to obtain a reference potential connection, wherein the discriminating means further comprises means for comparing the width of the pulse signal detected on the metallic case to a low threshold and to a high threshold.

8. The device of claim 7, wherein the discriminating means further comprises means for delivering an indicator representative of a presence of a connected bipolar probe in response to the width of the pulse signal detected on said case being less than said low threshold.

9. The device of claim 7, wherein the discriminating means further comprises means for delivering an indicator representative of an absence of a connected probe in response to said width of the pulse signal detected on said case being included between said low threshold and said high threshold.

10. The device of claim 7, wherein the discriminating means further comprises means for delivering an indicator representative of a presence of a connected monopolar probe in response to the width of the pulse signal detected on said case being not less than said high threshold.

11. The device of claim 2, wherein said first terminal further comprises a ring terminal for coupling to a proximal ring terminal of a bipolar probe and the means for selectively producing stimulation pulses further comprises means for applying a monopolar stimulation pulse and controlling said first and second switches to obtain a reference potential connection, and the discriminating means further comprises means for comparing the width of the pulse signal detected on the first terminal to a low threshold and a high threshold.

12. The device of claim 11, wherein the discriminating means further comprises means for delivering an indicator representative of an absence of a connected probe in response to the width of the pulse signal detected on said case being included between said low threshold and said high threshold.

13. The device of claim 11, wherein the discriminating means further comprises means for delivering an indicator representative of a presence of a connected bipolar probe in response to the width of the pulse signal detected on the first terminal being less than said low threshold.

14. The device of the claim 11, wherein the discriminating means further comprises means for delivering an indicator representative of a presence of a connected monopolar probe in response to the width of the pulse signal detected on the first terminal being not less than said high threshold.

15. The device of claim 2, wherein said first terminal corresponds to a proximal electrode of a bipolar probe and said second terminal corresponds to a tip electrode of a bipolar probe and the means for selectively producing stimulation impulses further comprises means for applying a bipolar stimulation pulse between the first and second terminals and controlling said first and second switches to obtain a reference potential connection, and the discriminating means further

comprises means for comparing the width of the pulse signal detected on said metallic case to a high threshold and a low threshold.

16. The device of claim 15, wherein the discriminating means further comprises means for delivering an indicator representative of an absence of a connected probe or a non-implantation of the case in a presence a connected probe in response to the width of the pulse signal detected on said case being included between said high and low thresholds.

17. The device of claim 16, wherein the discriminating means further comprises means for delivering an indicator representative of a presence of a connected bipolar probe in response to the width of the pulse signal detected on said case being less than the low threshold.

18. The device of claim 16, wherein the discriminating means further comprises means for delivering an indicator representative of a presence of a connected monopolar probe in response to the width of the pulse signal detected on said case being not less than said high threshold.

19. The device of claim 1, wherein said generator comprises an initial set of operating parameters corresponding to a temporary operating mode with reduced functionalities and a general set of operating parameters corresponding to at least one fully functional operating mode, wherein the control means further comprises means for operating said generator in said initial set of operating parameters prior to a delivered indicator corresponding to an implantation and means for operating said generator in said general set of operating parameters in response to a delivered indicator representative of the presence of a connected probe.

20. The device of claim 19, wherein said control means, further comprises means, responsive to delivery of an indicator representative of the presence of a connected probe, for

carrying out at least one of activating an analog circuit for detection of cardiac activity, activating a physiological or activity sensor; programming of a monopolar or bipolar type of stimulation according to the delivered indicator; initializing algorithms for the operation of the device; resetting and activating of a diagnosis counter; and the inscribing in a memory a date of implantation.

21. The device of claim 1, further comprising a safety means for switching operation of said devices to a mode of safety with monopolar stimulation, said safety means being responsive to the device operating in a bipolar stimulation for a connected bipolar probe and subsequent delivery of an indicator representative of an absence of a bipolar probe.

22. The device of claim 1, further comprises a safety means for authorizing a bipolar mode of stimulation only if the discriminating means delivers an indicator representative of the presence of a bipolar probe, said safety means being responsive to an instruction to set device operation to a bipolar mode of stimulation.